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January 31, 2006

FOR THE PUBLIC RECORD

Eileen Wenger Tutt, Assistant Secretary
California Environmental Protection Agency
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Re: CLIMATE ACTION TEAM DRAFT REPORT

Dear Ms. Tutt,

I am writing in connection with the Climate Action Team's (CAT) Draft Report as posted on December 8, 2005 and supplemented on January 12 and January 19, 2006.

My primary purpose is to transmit for the record the UC Berkeley Report *Managing Greenhouse Gas Emissions in California,* which is included herewith as an electronic attachment. The report can also be accessed at *http://calclimate.berkeley.edu,* together with some supporting materials.

The report *Managing Greenhouse Gas Emissions in California* was written by a group of a dozen economists from eight different institutions working under the direction of my colleague Professor Alex Farrell and myself. I am delighted that such a distinguished group of experts agreed to join in this collaboration.

The report consists of white papers on a number of topics relating to various aspects of climate change policy in California, including an assessment of technologies for reducing greenhouse gas (GHG) emissions; an evaluation of what can be learned from past experience with policies to promote technological innovation that could be applied to climate change policy in California; an assessment of how technological change can be factored into economic models used for analyzing climate change policies; assessments of economic issues associated with reducing GHG emissions from automobiles and increasing end-use energy efficiency in California; an evaluation of lessons that can be learned from past experience with cap-and-trade programs; an assessment of needed improvements in the treatment of the electricity sector in modeling the California economy; and an empirical assessment of the likely impact on the California economy of some policies to meet the Governor's 2010 and 2020 GHG emission targets. The last piece is based on the application of a new state-of-the-art model of the California economy, Berkeley Energy and Resources (BEAR) model, which has been developed

by my colleague Professor David Roland-Holst as a successor to the EDRAM model used in the CAT Report.

Below, I summarize some of our salient findings and then comment on a couple of related questions that have arisen.

Our empirical analysis focuses on eight of the 38 policies proposed by CAT; the policies we analyzed include building efficiency, vehicle emission standards, HFC reduction, manure management, semiconductors, landfill management, afforestation, and cement manufacturing. We find that:

- These policies can yield net gains for the California economy, increasing growth and creating jobs. These eight policies can achieve almost half of the Governor's GHG emission 2020 target while increasing Gross State Product by about $60 billion and creating over 20,000 new jobs.

- There are numerous additional climate action initiatives beyond those that have been modeled, many of which will also improve California's economy. Based on what we know so far, it is likely that California can reach the 2020 target with a net gain for the state economy.

- Voluntary measures, while helpful, are insufficient to yield the required reductions. Designing an effective combination of regulatory standards, market-based approaches (such as a well-designed cap-and-trade program for GHG emissions) and technology innovation policies are the best way to cost-effectively reduce greenhouse gas emissions in California.

- Technology innovation, spurred by a combination of regulations and incentives, will be needed to shift the economy over the long term away from carbon-based fuels in order to the 2050 GHG emission target. By acting now, California can gain a competitive advantage by becoming a leader in the new technologies and industries that will come into existence worldwide due to the common goal of reducing GHG emissions.

Thus, although the BEAR model differs from the EDRAM model in several important ways, including more detail for key emitting sectors, a more accurate representation of energy flows in California, and a dynamic rather than a static representation of the evolution of the California economy, our analysis offers an independent verification of the CAT Report's conclusion that climate action can yield net economic benefits to California.

Our study was supported by the Energy Foundation and the Hewlettt Foundation, to whom I am very grateful. The study was conducted over a ten week period, from mid-September to the end of November, and the macroeconomic analysis with the BEAR model was just one part of it.

The study work plan did not call for the use of BEAR to analyze the specific emission reduction policies being identified by CAT. Instead, we were to analyze existing policy initiatives such as AB 1493 and the Renewable Portfolio Standard, and some new policies such as a GHG cap-and-trade system and alternative scenarios for energy-efficiency-driven reduction in energy demand and new non-fossil energy generation and pollution control technologies.

We were proceeding to develop those analyses when, in the course of a conference call of the team managing the climate impact studies, on which you and I both serve, you mentioned to me in passing that you expected us to conduct an economic analysis of the GHG reduction strategies being developed by CAT. This came as a surprise since this was not part of our work plan, but I said that we would do the best we could to accommodate your request.

I have been asked why we did not analyze *all* the emission reduction strategies identified by CAT in its Tables 5.1 and 5.2? Why did we pick the strategies that we did analyze?

Many of the emission reduction strategies involve highly specific activities for which detailed information is required. To analyze them using a computable general equilibrium model such as BEAR, one needs to know which specific economic sectors in the model will incur costs as a result of the policy and what those costs are year by year from now through 2020. In the case of policies affecting electricity demand or supply, one needs to know exactly what type of generating unit will be affected, in order to develop an accurate assessment of the impact on total GHG emissions. If these details are uncertain or unknown, this makes it difficult to provide a reliable and credible analysis of the economic impact.

We considered all the information available to us in painstaking detail. Despite limited time and resources, we devoted a considerable effort to this. In the end, we assessed the economic impact of every strategy for which we felt confidence in the information available to us. This is why our analysis was limited to the eight policies evaluated in our report.

As better information develops, we certainly intend to expand our analysis.

As you know, we shared our input data with the Climate Action Team in December. We offered to meet to explain our data and share further information about our model analysis, but this offer was not taken up. On January 19th CAT posted a memorandum documenting the inputs used for the EDRAM analysis. This identifies us as the source for some of the information. However, inspection of the memorandum reveals that, in some cases, the use of our data was incorrect or inconsistent with our understanding of the primary data on which we relied. To clarify the situation, we have posted our data on the web page cited above.

Going forward, I believe there needs to be more co-operation and better co-ordination among technical experts working on these issues, whether in state government or at universities, think tanks, and stakeholder groups. This will best be accomplished if different parties share data before they have completed their analyses and have drawn their conclusions. Accordingly, the Richard and Rhoda Goldman School of Public Policy will convene a public workshop at Berkeley at the beginning of March to discuss the technical aspects of the macroeconomic modeling of climate change policies in California. The date and location will be announced shortly, and an invitation will be sent to all parties on the CAT mailing list.

I understand that the Climate Action Team will continue to refine and extend its analysis of the economic implications of GHG reduction in California. We at UC Berkeley will be continuing our own research on this topic, and we look forward to working with the Climate

Action Team and with other interested parties in what we hope will be a productive policy conversation.

Sincerely,

Michael Hanemann
Chancellor's Professor

Cc Deputy Secretary Anne Baker
Secretary Alan Lloyd